Menlo Park Notebook #230 [N-81-03-18]

This notebook covers the period March-June 1881. The entries are by Francis Jehl and consist of notes, calculations, and a few drawings relating to meter experiments. The label on the front cover is marked "Experimental Lamps" and "Francis Jehl." The book contains 276 numbered pages.

Blank pages not filmed: 118-275.

Missing page numbers: 1-2, 39-40.

Log of .018738 =

—2.2727232

Log .0659274 = $\bar{2}.8190659$

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May 1, 1896

March 18, 1881.

Meter No. 1

3/18/81. Started 1.14 P.M. – Out at 6.03 P.M. (289")
" 7.05 " — " " 8.25 " (80")
3/19/81. " 8.44 A.M — " " 10.50 A.M (126")
" 10.57 " — " " 12.02 P.M. (65")
" 1.10 P.M — " " 5.02 " (232")
792"

9)100
120

11
100
1.
4

10)100
10

9)100
11.1

10

March 18, 1881.
Meter No. 2

3/18/81. Started 1,15 P.M. – Out at 6.03 P.M (288")
" 7.05 " – " " 8.25 " (80")
3/19/81. " 8.43 A.M – " " 10.50 A.M. (127")
" 10.57 " – " " 12.02 P.M. (65")
" 1.11 P.M – " " 5.02 " (231")
797"

March 18, 1881.
Meter No. 3

3/18/81. Started 1.15 P.M – Out at 6.03 P.M (288")
" 7.05 " – " " 8.25 " (80")
3/19/81. " 8.42 A.M – " " 10.50 A.M (128")
" 10.57 " – " " 12.02 P.M (65")
" 1.11 P.M – " " 5.02 " (231")
792"

March 18, 1881.
Meter No. 4

3/18/81. { Started 1.16 P.M – Out at 6.03 P.M (287")
" 7.05 " – " " 8.25 " (80")
3/19/81. { " 8.40 A.M – " " 10.50 A.M. (130")
" 10.57 " – " " 12.02 P.M (65")
" 1.12 P.M – " " 5.02 " (230")
792"

March 18, 1881.

Meter No. 5

3/18/81 { Started 1.16 P.M – Out at 6.03 P.M (28
" 7.05 " – " " 8.25 " (80
3/19/81 { " 8.39 A.M – " " 10.50 A.M (131")
" 10.57 " – " " 12.02 P.M (65")
" 1.13 P.M – " " 5.02 (229")
792"

March 18, 1881.

Meter No. 6

3/18/81 { Started 1.17 P.M – Out at 6.03 P.M (286")
" 7.05 " – " " 8.25 " (80")
3/19/81. { " 8.37 A.M – " " 10.50 A.M (133")
" 10.57 " – " " 12.02 P.M (65")
" 1.13 P.M – " " 5.02 " (229")
793"

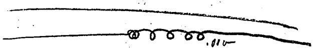
March 18, 1881.

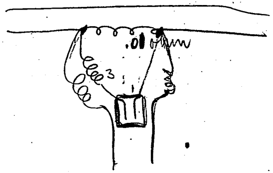
Meter No. 7

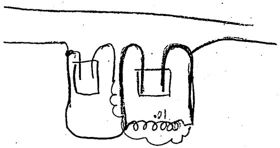
(366") 3/18/81 { Started 1.17 P.M – Out at 6.03 P.M
" 7.05 " – " " 8.25 "
(428") 3/19/81. { " (135") 8.35 A.M – " " 10.50 A.M
" (65") 10.57 " – " " 12.02 P.M
" (228") 1.14 P.M – " " 5.02 "
794"

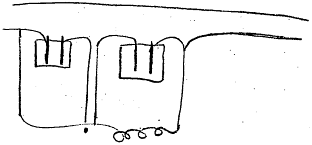
March 18, 1881.
Meter No. 8,

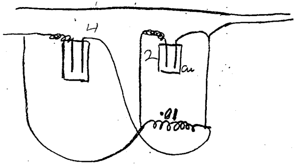
3/18/81 Started 1.17 P.M. – Cut out at 6.03 P.M. (286")
" 7.05 " – Out at 8.25 " (80")
3/19/81 " 8.34 A.M. – " " 10.50 A.M. (136")
" 10.57 " – " " 12.02 P.M. (65")
" 1.14 P.M. – " " 5.02 " (228")
795"


.11v


.01 ohm
3
1


.01




4
2
cu
.01

Mar. 23, 1881.

Meter test.

1000
326
674

326 : 674 :: X : .0187385

$\frac{326}{674} = \frac{X}{.0187}$

326 x .0187 = 674y

326
.0187385
1124310
374770
562155

674 / 6.1087510 .00906344 $\frac{194}{674}$
6066
4275
4044
2311
2022
2890
2696
$\frac{194}{674}$

Mar. 23, 1881.

1000
369
631:

Meter test.

369 : 631 :: X : .0187385
369
1686465
1124310
562145
6.9144065

631 / 6.9144065 .01097 37 $\frac{18}{631}$
631
6144
5679
4650
4417
2336
1893
4435
4417
$\frac{18}{631}$ =

1000
490
510

490 : 510 :: 4 .0187

.0187 4
510 3
1870
9 8 5
9.5370

.01877 7 6
490 3 2 7
168300 3
748
510) 9.16300 (

1.3
3
3.9
1.3
5.2

510) 4900 (.96 Rodzell
4590
3100
3060

.96
3
2.88

1000
570
430

570 : 430 :: 4 : 1

54
570) 4300 (.75
3990
3100

2.96
2.88
3.84) 430 (570 (1.3
430
1400
1290

610

1000
611
389

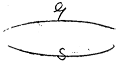
611 : 389 :: x : 1

6 5 5 6 7

389) 611 (1.57
389
2220
1945
2750
2723

1.57 ohms
3
4.71 comp R
1.57 meter
6.28

.96
3
2.88 comps
96
3.84



$\frac{g}{g+s}$ thro S $\frac{s}{g+s}$ throug g

$\frac{6.28}{628 \quad 3.84}$

$\frac{3.84}{62}$ 2

3.84
6.28

6.28) 10.12 (1.61
628
3840
3768
0720

3.84) 10.12 (2.61
768
2440
2304
0760

1.61
2.61
4.21

1000
611
389

R Hight cell 1.57 ohm

611 : 389 :: x : 1

389) 611 (1.57
389
2220
1945
2750
32

1.57 2
3
4.71
1.57
6.28

1000
447
553

Low cell .8 ohm

447 : 553 :: x : 1

553) 4470 (.7 3 .8
3871
599
42

553) 4470 (.808
4424
4600

.8
3
2.4
.8
3.2

3.2
3.26.28

~~6.28~~
~~3.2~~
~~10.48~~

6.28
3.2~~4~~
9.48

$$\begin{array}{r} 6.28 \\ 3.2 \\ \hline 9.48 \end{array}$$

$$\frac{3.2}{6.28+3.2} \qquad \frac{3.2}{9.48} = \frac{1.6}{4.74} = \frac{.8}{2.37}$$

$$\begin{array}{r} 3.2 \\ \hline 9.48 \end{array}$$

$2.37.)\ .800$

80

$$\frac{6.28}{9.48} = \frac{3.14}{4.74} = \frac{1.57}{2.37}$$

2 $2.37)\ .800\ ($.

2

$$\begin{array}{r} 237)\ 800\ (.37 \\ 711 \\ \hline 890 \\ 777 \\ \hline \end{array}$$

$$\begin{array}{r} 37 \\ 66 \\ \hline 4 \end{array}$$

2 4

$$\begin{array}{r} 237)\ 1570\ (.662 \\ 1422 \\ \hline 1480 \\ 1422 \\ \hline 580 \end{array}$$

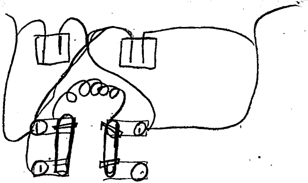
$$\frac{80}{237} \quad \frac{157}{237}$$

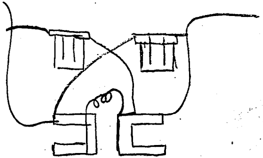
6.28 ohm
3.2

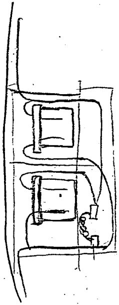
$\frac{6.28}{6.28+3.2}$ $\frac{3.2}{628+3.2}$

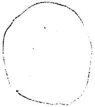
```
 6.28
 3.2
-----
 9.48) 6280 (.662
       5688  .337
       ----
        5920
        5688
        ----
         2320

  948) 3200 (.337
       2844
       ----
        3560
        2844
        ----
        7160
```









1000
441
559

441

441 : 559 :: X : 1

551) 4410 (.7
3857
5530

551) 4410 (.800
4408
2000

1000
379
621

379 : 621 :: X .0187

379
.0187
2653
3032
379

621) 7.0873 (.011
621
877

427

1000
427
573

573) 4270 (.72
4011
1590

1000
402
598) 4020 (.67
3588
4820
4186
134

1000
357
643) 3570 (.55
3215
3550

$18\frac{6}{16}$ 3 4 $1\frac{4}{16}$

1000
387

613

387 : 613

6

387
.0187

2709
3096
387

613) 723.69 (.011
613

1106

1000 3 3
334

666) 3340 (.501
3330

1000

332

1000
641

359

359
8
2872 7 4

641 : 359 :: X : 1

10
5 3 10
359) 641 (1.7 ohms
359

2820

1000
595
405

1000
-615
385

615 : 385 3 5

385) 615 (1.5
385
2300
2310

405) 595 (1.46
405
1900
1620
2800

Low meters
.50 of an ohm

1.7 a 1.7 ohms

1.7
3
5.1

.50
.1.5

Slate Paper

3000000

1800000 020

25) 3600000000 (14400000

25

110

100

100

1000
905

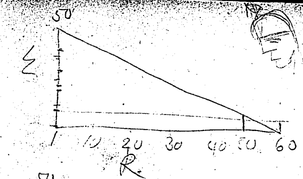
1000
921
79

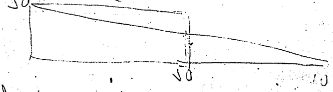
905 : 95 :: X .0187

905
.0187
6335
7240
905
95) 16.92335 (.18
95
742

921 : 79 :: X .0187

921
.0187
6447
7368
921
79) 17.2227 (.21
158
140





~~I tried~~
having set up 50 Watson cell put them all in series and then try them on my lines, which had 10+I R now when the circuit was closed I put the galv. at the begining and it

only gave a def of about 8, (after research I found the cause of this, the battery having so large a resistance themself it is nearly all lost in them when I close the circuit with only about 10 ohms.

I then took ten in series and 5 in multiple arc and got a def of 10.

[illegible] 1.08 v cel
5.40 = v

Def 319 = 5.4 v

Deflection on the beginning
308

*This time I got the potential at the extremity it was
337

Then put it on the beginning again and it was 343.
~~not quite at the extremity~~

* then at this place again
337

Then at the ~~[illegible]~~ extremity
337

319 = 5.4 V

5.4) 3190. (59.
270
490
486

59 div = 1 volts

310
59) 343. (5.813
295
480
472
80
59
210
177

339
002

59) 337 (5.713
295
420
413

1/0/59 (5.9
59
9

59) 336 (5.695
295
410
354
560
531
290
7

190

5.813 V at the beginning
5.695 V at the Extremity

100) 5.813 (.05813
2
.11626

5. 813 V beginning
5. 713 V end

813
116
1.07

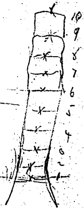
Bats 4 V = 321.5 def

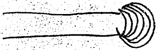
Line at Extremity,
342

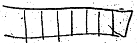
at beginning 350.9

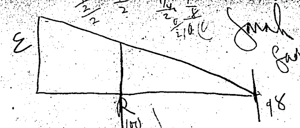
352.5 beginning
344.5 Extremity

Extremities 360
Beginning 365

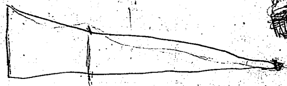

10
9
8
7
6
5
4
3
2
1

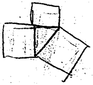


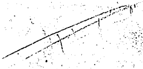


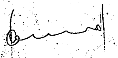

1/2/2
1/2
1/4/2 1/8
210
E
R
100
98

Jonah
Gadie









~~5 batteries = 320~~

5 cell = 262.5 def

def on lamp all at one end. Def on the begining 300.

def on Extremely 294

6.12 V at begining
6 at the Endd

Comes Exact with Calculated Res

54) 265.5 (5 $\frac{1.05}{5.40}$
20

54) 265.5 (49.1
216
495
486

49.1 dif = 1 V

49) 300 (6.12
294
60
49
110
98

100) 6.12 (.0612
2
.1224

49) 294 (6
294

When lamp
are all disconnected
298. beginning
294 End

---

when four on wire
taken End 293.5
beginning 297.5

---

when 6 were off
298 beginning

---

8 wires
292.5 End
298 beginning

---

49) 292.5 (5.9~~7~~ 8 ✓
245
475
441
340

6.08
5.97
.11

49) 298 (6.0~~8~~ 5
294
400

10602
2
1200

---

100)11=(.001

Orig No 1

1000 grams of white sand
100 gr " of Litharge
300 gr or Rosin
1 measure of Molasses
1 " " lin seed oil
This was boiled about 5^{m}

No 2

after 20^{m} boiling
This was not fluid ~~f~~
but a sort of plaster

No 3
some of the fluid
left from No 2

No 4
200 gr white sand
1/4 linseed oil
50 gr rosin

11

200 gr of sand
50 gr rosin
1/4 Mollassa

No 5
same at 11 only with
a little lin seed oil,

2182 D.R. (12 no)
Sod [illegible] & Chalk.

No 13

½ measure of Sand
1 of Chalk
& Glue water

No 14
Chalk & Glue water

15
Concentrated Solution of Alum
& Chalk.

16
Plaster of Paris &
Concentrated Alum. hardens quick

17
200 gr ~~Pb~~ lead oxide
1 measure chalk
Glue water

18

Same as above
only a little glycerine

19
Sand & Glue

~~[illegible]~~

20
[illegible] & glycerine

6

Plaster of paris & glue water

1

Plaster of Paris glue and Alums.

No 9

1/2 measure. Sand

1 .. Plaster of Paris

1 ... Car. Alum

Sets quick

1/2 measure sand

1 Plaster Paris

1 1/2 .. Car Alum

Samp 10

Sets a little slower as no 9

No 21

1 measure Plaster Paris

of .. of glue water

32

measure

1 Glue was

2 Plaster Paris

33

1/4 Measure Plaster Paris
1 Sand
1/2 Glue water

84

1 Measure Plaster
1 Sand
1 1/2 Glue water

36

3/4 Measure Con Alum
1 Measure Plaster Paris

35

1 Plaster
1 Measure Con Alum

29

Same as above no 33

39

1 Measure Plaster Paris

~~O~~

1/4 oz of Glue water
3/4 oz Alum Con.

30

1 Measure Plaster of Paris
1 " " Com Alum
1/4 Gluewater

28

1 1/4 Measure of Com Alum
1/4 Glue water
1 meas Plaster of Paris

1000001
100000

183.000
100

18300000
20

366,000,000 00

18,3000000
20

366,0000,0.00

May 26 1881

Copper wire sent by Moore from Phil. to be tested for Cond. for E. Ma. Works

497 : 503 :: X : .06 —

Temp 88.7°. $23\frac{1}{3}$° R.

1 Measurement.

502 : 498 :: ~~0~~ .06 — : X

Second measurement

Temp 88.7 $20\frac{1}{3}$° R

Length 114 feet

Diameter .134

Double covered cotton

F. J.

.0659274 Log = $\bar{2}$.8190659

$\frac{502.5}{4975}$: 497.5 :: $\frac{.065-}{X}$: X

502.5X = 497.5 X .065 —

$\bar{2}$.8190659
2.6967931
~~1~~ 0.5158590
2 7011361
$\bar{2}$.8147229 = Res =
.0652414 = Res of wire

at

134^2 log = 2.1271048
2
4.2542096 = 17956.

9.718 log = 0.9875769
4.2542096

.003824
30
.114720 Cor for Temp

— 1115

$\bar{4}$.7333673
2.0681859
$\bar{2}$.8015532
0.0472749
$\bar{2}$.8488281

.0659274 X 1.004433 = .066230656194
this is correction for the temp of German silver wire for 10 degrees C.

$\bar{2}$.8270548
2.6967931

1.5178479
2.7011361

$\bar{2}$.8067118 .065571

May 26 1881

German Silver wire sent by Bergmann to measure resistances per foot for that experiment on ~~distribution~~ for.

Spool No 1 large wire
.0365 diameter Temp 80°7
595 : 405 :: X : 2

$$\frac{595}{405} = \frac{X}{2}$$

405) 1190 (2.93 ohms
810
3800
3645
1550
1215

Length 24' 11'' or 24.9 feet

$\frac{605}{395} = \frac{x}{4.3}$

395) 2420 (6.12 ohms
2370
0500
395
1050

$\frac{597}{403} : \frac{x}{4}$ 2 3

403) 2388 (5.92
2015
3730
3627
1030

Spoole no 2

Temp 80°7

605 : 395 :: X : 4 = 6.12 ohms

Di .025"

Length 25' ½" .9 .9 4

12) 5.80 (.04 12 25.04 feet

Spoole no 3 Temp 80°7

597 : 403 :: X : 4 = 5.92 ohms

Diametr .025"

Length 25' ½"

$\frac{695}{305} = \frac{x}{10}$

```
305)6950 (22.78
    610
    850
    610
    2400
    2135
     2650
     2440
```

```
381) 6190 (16.24
     381
     2380
     2286
      940
      762
     1780
       24
        4
```

No 4 Temp 807°

695 : 305 :: X : 10

22.78 ohms

.0125 Diameter

Length 25' 1" 12)100(.083 96 40

No 5 Temp 7°
817°

619 : 381 :: X : 10

16.24 ohms

Di .0160

Length 25' 1"

12!

$$\frac{674}{326} = \frac{x}{15}$$

```
    674
     15
   3370
   674
326)10110.0(31.01
    978
    330
    326
     400
```

No 6 Temp. 80°F

674 : 326 :: x : 15

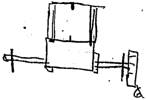
31.01 ohms

.007 Diamer

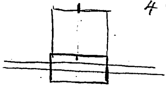
length 12' 7½"

```
7.5)120(1.6     120)750(.62
     75             720
     450            300
     4.70           240
```

3

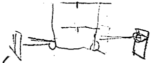


607.2
165 $CuSO_4$
442.2



1175
1010
165

$CuSO_4$ = 165
H_2O 442



165)442(2.68
330
1120
1155

82 221 4
2
42 110
21 55 2 6
7 11 1 3

Sulphate Cu solution at freezing [illegible]

Beaker weighs 1010 grams

1617.2

Beaker with solution	1617.2
Solution alone	1010
	607.2 gr
sulphate of Cu alone with Beaker	1.175

I took the above solution and made it saturated and then put it in ice, got 0 temp, and then decanted the liquid, left the deposited crystals behind.

I made the saturation point by taking 165 of $CuSO_4$ to 442 H_2O.

Meter Experiment

standard arm of bridge 9 ohms
I commenced the experiment
by first putting very hot water
in the pail. Room temp 74°7
Thermometer 91°7 divisions 577
" " " 105° " " " " 575
106°5 572
106.75 569
It decreased slowly, here
I put some cool water
in to decrease the temp
Temp 97°7 = divisions 567
Room 767°
Temp 90 divs 563
" 80 558
The wire seems to cool faster
than the solution.

76 717° divisions 533

69 530

Took the cell & put it in ice water and got the following Res.

---

1 ohm in standard arm

8°C - - - 645

7 C - - - 646

- - - 647

10° 609

12 590.5

13 579

15 566

°C			divisions	Res
8		divisions	645 52	1.82
7	"	"	646	
10	"	"	609	1.5
12	"	"	590.5	1.4
13	"	"	579.	1.3
15	"	"	566	1.3
18	"	"	535	1.1
19	"	"	532	1.1
20		"	527.5	1.1

5	656
9	606
10	591
14	557
15	545
16	535
18	520
20	507
21	500 = 1 [illegible]

Water 9^{c} divisions

9^{c} ... 492

Water when put in 63°C at 490.5

62	o 490.5
60	o 487.
58	" "
57	" "
55	490
44	497
36	500
30	503
20	510
15	515
10	520
5	)

$\frac{1}{600+1}$ Through coil

$\frac{600}{600+1}$ Through shunt

```
601 ) 1.000   (.001663W
       601
       3990
       3606
        3840
        3606
         2340

601 ) 600.0   (.998336W
      5409
       5910
       5409
        50100
        4808
         2020
         1803
          2170
          1803
           3670
           3606
```

~~.001663 Weber on cell~~
~~.326~~
~~9978~~
~~3326~~
~~4989~~
~~.000542138 mg of Cu 1 Sec.~~
~~60~~
~~.32528280 mm.~~
~~60~~
~~19.5169680601 hr~~
~~5 hr~~
~~97.58448403005 hr~~
~~30~~
~~2927.545209000~~

.326 3 1
60
19.560 3
60
117.3600

2
.5
1.0

2.2
2.2

.001660
60
.9600

.001663
.326
9978
3326
4989
.000542138 1 Se.
60 1 m
.03252828 0 1 m
60
19.5169380 1 hr
5
97584690000 5 hr
30
2927540700000 mg for
1 lamp burning 5 hr day + 30 days long.

Cell

1 put on 1.50 P.M.
1 Ohm at 1.55 P.M.
Stop at 2.15 (74 division

2
Put on at 2.17
1 ohm at 2.30
Stop at 2.42

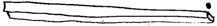
---

3 put on at 2.48
Stoped at 3.8 P.M. division
79

June 4 1881

Test of Three Copper bars.

First bar without any joints clear



286 : 714 :: X : .0082409

$\frac{286}{714}$ $\frac{X}{.008}$

714) 286 x .008

2.4563660
$\bar{3}$.9159746
0.3723406
2.8536982
$\bar{3}$.5186424 = 33009

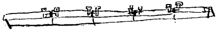
= .0033009 ohms

8) .0659274
.0082409

without joints .0033009
with " .0034649
Soldered " .0034152

Second bar

connected by four joints
not soldered
screwed tight



296 : 704 :: X : .0082409

$\bar{3}$.9159746
2.4712917
0.3872663
2.8475727
$\bar{3}$.5396936
.0034649 Ohms

Third bar same as second but soldered

293 : 707 :: X .0082409

3.161
$\bar{3}$.9159746
2.4668676
0.3828422
2.8494194
$\bar{3}$.5334228 34152
= .0034152

June 5 1881

#2 300
F 75

20

wire .009 = 7.8 feet per ohm at 60°7

7.8
18

0.8920946
1.2552725
2.1473671 = 140.40

140.40 feet of .009 = 18 ohms

60°7
32
28

18 = ~~1.2552725~~
x ~~-1.9744656~~
.9429
~~1.2297381~~ = Resist 0°7
~~0.8920946~~
~~2.1218327~~ =

138 Feet at 0°7 132383831

224
1034
1846

138.3 feet of No .009 wire at 07° = 18 ohms!

Same wire at 607° =

~~2.1218327~~
~~0.0255107~~
~~2.1473434~~

1.0605

0.0255107

~~1.2297381~~
~~0.0255107~~
~~1.2552488~~ 17.999

1.2552725
0 0255107
1.2807832 = ~~19.08901~~

19.089 ohms

19.089 ohms at 60°7 = 18 ohms at 0°7

1.2807832
0.8920946
2.1728778 = 148.8 feet

20
5
15°

Test for Mr Kruesi
Copper 96 % Cu + 4 of Tin

315
314
308
3|937
312.3 Cast

293
301.5 2
298
3|892.5
297.5

312 : 688 :: X : .0082409
688   .008

June 5 1881

2.4941546
-3.9159746
0.4101292
2.8375884
-3.5725408 .0037371 Res

Cast

---

297 : 703 :: X : .0082409

93%

-3.9159746
2.4727564
0.3887310
+2.8469553
-3.54[illegible]7757
.0034815 pure Cu

June 5 1881

Meter Experiments

Weight of Plates

No 10 deposited 1220+3.9 =
1223.9 grains

1150
152
No 10 1165.2 grams

deposited 1221.4

No 8 deposited cell

Weight = 1192 grns
~~1194.4~~

No 8 1160.9 grans
deposited 1194.4

No 4 deposited plate

1170
14.9
118.4.9 grans

No 4 1127.5 grans
deposited 1187.2
1125.

No 6 deposited 1214.2 grs

No 6 1091.9 grns
No 6 deposited 1216.6
1084.3

No 3 deposited 1257.1 gr

No 3 ------- 1123.5 gr

no 3 deposited. 1259.7
no 3 ------- 1121.1

No. 0. deposited 1190.4 gr

No. 0 —— 1073, 8 grm

No deposited 1192.9
No —— 1171.4

38
64
52

1
82

50)100(.02

Put the current on at one oclock P.M. June 5 1881

Put the current off at 9 P.M.

2.5
2.4
2.3
2.4
2.6
2.5
6)14.7
2.45

1 grains ~~grammes~~ = .0647988 grammes

27 − 2.8115616
3 0.3891661
$\bar{1}$.2007277

2.45 grains = .15875 grammes

1259.7
1257.1
2.6

$\frac{w}{.326t}$ in which t time in seconds

92.9
90.4
2.5

60
60
3600
8
28800

$\bar{4}$.4593925 − $\bar{1}$.2007137
$\bar{1}$.5132176 3.9726101
3.9726101 $\bar{5}$.2281036

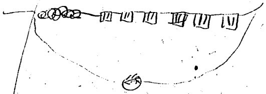
.0000169 88

One new Standard cell.

deflection ~~339 — 359~~

352 — 335

deflection between the ~~H~~ two ends of the depositing cells + Resistances



144 — 154 def

Standard cell

333 ——— 353

On deposition cells + resistances. 157 — 142

142 — 157

On Resistances were alone. 91 — 103

91 ——— 103

Standard cell

353 ——— 332

333 ——— 359

333 359

def on depositing
cell . 56 —— 48
56 – 48

Standard cell
352 — 333
358 — 333
358 — 333.
358 — 333

On cell 0
5 — 14
5 — 4

On cell 3 13.5 — 5
13.5 — 5

On cell 6. 4.5 — 13.
4.5. 13.

On cell 4 14 — 5
5 — 14

On cell 8) 12.5 —— 3.5
12.5 —— 3.5

On cell 4 — 13.5
4 — 13.5

Standard cell
332 —— 358
332 —— 358

Sunday night

~~Deposit~~ Cell June 5 1881

Put current on at 11.30 AM.

Stop June 1881

Stop at half past four 4.30. Going 41 hours

30 24
22
4
1

30 24
30 12
4
1

30 24
12
4
1

41 hours 31

No 3

deposited plate 1272. grms
1259.7
gain 1 2.3

1282.6
1272.
10.6

No. 10

deposited plate 1238.7 grms
1226.4
gain 1.2.3

1249.4
1238.7
10.7

37) 10.5 grams

370) 1050 (.2
740
310

10.6
10.5
10.5
10.7
10.6
10.7
6) 63.6
10.6

5

370) 10.60 (.28
740
3200
2980

370) 1060 (286
740
3200
2960
2400
90

4

.36

4

no 8

deposited plate 1206.8 grams
~~1187.2~~
1194.4
gain 12.4

1217.3
1194.4
1217.32 2.9 grams
1206.8
10.5

no 4

deposited plate 1199.5 grams
1187.2
gain 12.3

1210.2
1199.5
10 7

12.3
12.3
12.3
12.4
12.5
12.5

8 hr = 2.45 grains

6) 74.3
12.38 grains in 41 hours

8) 41 (5.12
40
18
2

5.12
2.45
2560
2048
1024
12.5440

1 hour by first experiment .306 gr
by second Experiment .302 grains
- 286
difference .016 mg

.302

100).302
1
3
3

)302

100) 302 (
3.2) 15 / 160 (

3 5

No 6

deposited plate 1229.1 grns
— 1216.6
gain 12.5

1239.7
1229.1
10.6

No 0 No.

deposited Plate 1205.4 grns
— 1192.9
gain 12.5

1215.9
1205.4
10.5

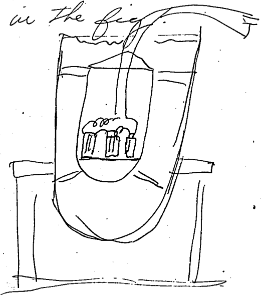
.302
37
2114
906
11.174

June 8 1881

Put current on cell at 8.30 AM.

Stop current Just at 9th 9.30 P.M.

The cell are all in the calorometer as shown in the fig.



Insulation Test

50)350(7

1 battery 1 def

50 bat 234 — 239

2

234
239
2)473
236

2(

7)236
33.7

5

50 battery 33.7 stronger than the one.

one battery alone through
the Res. 304 — 313

~~205~~ 200 def with all
the batteries on insulator

308
33.7
2156
924
924
10379.6
183000
311388000
830368
103796

200)1899466800.0(9497334 ohms
1800
994
800
1946
1800
1466
1400
668
600
680
600
800
800

304
313
2)617
308

100)5280(52.8
500
280

3 183000
308

308
33.7
2156
924
924
10379.6 def with all [illegible]
183000
3113880000.0
830368
103796

~~200~~)18994(668(~~000~~(949733
~~6800~~
9497334 ~~0~~
994
800
1946
1800
1466
1400
666
600
668

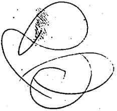
52.8
100
5280.0

52.8
100
5280.0

6.80

Plate No 8

Plate No.



```
52.8 ) 9,497.3340 ( 179,873
       528
       4217
       3696
        5213
        4752
         4613
         4224
          3894  2
          3696
           1980
           1584
```

France Menlo Park
N.J.

Thomas A Edison

Hon John K. Porter
333 ~~Fifth~~ ave
N.Y.

France

June 11 1881

German Silver wire for Standard resistance boxes

$\frac{986}{14} = \frac{x}{.06}$ .0659274 log = $\bar{2}$.8190659

$\frac{9.86 \times .065}{14}$

Marked 30½.

$\bar{2}$.9938769
$\bar{2}$.8190659
1.8129428
1.1461280
0.6668148

4.63 ohms

Marked 32

e

$\bar{2}$.8190659
2.9960737
1.8151396
0.9542425
0.8608971 = .725 ohm

Marked 30 $\bar{2}$.8190659
2.9916690
1.8107349
1.2787536
0.5319813 = 3.40 ohms

- 2.8190659
2.9934362

1.8125021
1.1760913

0.6364108 ! 4,33

Marked 29

Marked 23

- 2.8190659
2.9661417

1.7852076
1.8750613

$\bar{1}$.9101463

.813 ohms

Marked 31

- 2.8190659
2 9947569

1.8138228
1.0791812

0.7346406

5.42 ohms

Marked 25

2.8190659
2. 9845273

1.8035932
1.5440680

0.2595252 = 1,81 ohms

Marked 20

$$\begin{array}{r} -2.8190659 \\ 2.9566486 \\ \hline 1.7757145 \\ 1.9777236 \\ \hline .7979909 \end{array}$$

= .628

Marked 26.

$$\begin{array}{r} -2.8190659 \\ 2.9805034 \\ \hline 1.7990693 \\ 1.6532125 \\ \hline 0.1468468 \end{array}$$

1.39 ohm

Marked 28

$$\begin{array}{r} -2.8190659 \\ 2.9894498 \\ \hline 1.8085157 \\ 1.3802112 \\ \hline 0.4283045 \end{array}$$

= 2.68

Marked 24

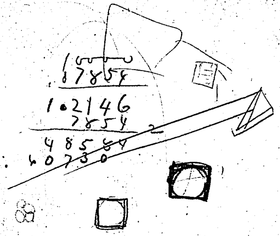
$$\begin{array}{r} -2.8190659 \\ 2.9694159 \\ \hline 1.7884818 \\ 1.8325089 \\ \hline \bar{1}.9559729 \end{array}$$

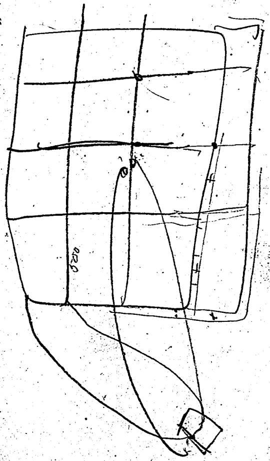
.903

10000
17854

1.2146
7854 2

48584
40730





20 6lead